M E M O R A N D U M

MWH
MONTGOMERY WATSON HARZA

To: George AFB RPM Group **Date:** May 21, 2002

From: MWH George AFB Team **Reference:**

Subject: Proposed Wells for Weekly Measurements During GETS Test

---

This memo presents a list of wells, revised based on comments received at the 29 April 2002 BCT meeting, to be considered for frequent collection of water level measurements during the proposed shut-down and re-start of the OU 1 Groundwater Extraction and Treatment System (GETS), as described in the memo dated 16 May 2002. This effort is in support of development of the Hydrogeologic Conceptual Site Model (CSM) for George Air Force Base (GAFB). The proposed approach to development of the Hydrogeologic CSM and this well list are intended to serve as the basis for ongoing discussion among BCT members, and are subject to change. This memo represents RPM group input to date, and revisions include specific references to the proposed Runway Faults (Cox, 2000) in rationale for the applicable wells. The proposed approach includes collecting water level measurements monthly from approximately 110 wells, and more frequently from approximately 30 wells, during the GETS shut-down and re-start. This list includes 40 wells that may be strong candidates for frequent measurements, as explained below. (The current monitoring well network does not include wells that would be useful in assessing the proposed Turner Springs, Adelanto, and Shay Road faults. However, the field mapping elements of the proposed Hydrogeologic CSM approach and additional proposed projects are expected to address these faults.)

Rationale for Selection of Wells for Weekly Water Level Measurements During the Proposed GETS Shut-down and Re-start

A controlled experiment of shutting down the GAFB GETS system will yield information about several areas of concern. The three main factors that influenced the choice of key wells for weekly water level measurements were the following:

1) Extraction wells. Frequent measurements at extraction wells during the experiment will provide data to help refine estimates of capture zones and radii of influence, and to test aquifer parameter values and well efficiencies.

2) Proximity to the new percolation ponds. Frequent measurements will provide data to help define any effects the use of the percolation ponds has on the Lower Aquifer.

3) Conceptual Site Model inputs. Frequent measurements will yield data in numerous areas that will be used to develop the Hydrogeologic CSM, including:
   - establishing hydraulic connections and preferential pathways within the Upper Aquifer;

- analysis of hydraulic relationships among wells northwest of, between, and southeast of the proposed Runway Faults (Cox, 2000);
- analysis of hydraulic relationships between adjacent wells screened in the Upper and Lower Aquifers (possible erosional gaps)
- well pair analysis to measure vertical gradients within the Upper Aquifer;
- potential re-mobilization of TCE during GETS start-up period;
- observation of pre-GETS conditions with a dense monitoring network may assist in modeling source areas with more accuracy; and
- potential adverse effects on Lower Aquifer extraction wells of the new VVWRA percolation ponds.

Wells for Consideration for Weekly Water Level Measurements
During the Proposed GETS Shut-down and Re-start

The following is a prioritized list of 40 wells from which frequent (at least weekly) water level measurements during the GETS test would yield relevant data to meet the above objectives, along with a brief rationale for selection of each. Wells are in groups of 10, with the first group being most valuable, the second group the being next most valuable, etc.

MW-103/MW-104	Well pair near percolation ponds
NZ-21/NZ-22	Well pair between EW-1/EW-9
NZ-55	Current extraction well
NZ-56	Down-gradient of NZ-55, near edge of Upper Aquifer
NZ-81	Cross-gradient from NZ-55
NZ-82	Cross-gradient from NZ-55, southeast of proposed Runway Faults
NZ-33	Closest down-gradient well to percolation ponds
NZ-17	Closest up-gradient well to percolation ponds
NZ-28A/NZ-32	Well pair near center of EW-4, -5, -10, -11, -12
NZ-12/NZ-20	Well pair east of EW-9 (highest gpm in the Upper Aquifer), northwest of proposed Runway Faults
NZ-25/NZ-31	Well pair near EW-3
NZ-44	Lower Aquifer well near EW-1
NZ-84	Lower Aquifer well near NZ-55
NZ-74	Lower Aquifer well to monitor EW-18 (pumps from Lower)
NZ-103	Near the northern cluster of Upper Aquifer extraction wells, in Arroyo
NZ-105	Contaminated Lower Aquifer well, penetrates Upper Aquifer, in Arroyo (possible erosional gap?)
NZ-11/NZ-30	Well pair near EW-13, between proposed Runway Faults
NZ-73	Lower Aquifer well near EW-8 (pumps from Lower)
FT-01	Down-gradient from percolation ponds
FT-02/FT-05	Well pair between percolation ponds and EWs
MW-35	Up-gradient from percolation ponds
NZ-83	High TCE, near NZ-55, southeast of proposed Runway Faults
MW-102	Between percolation ponds and NZ-55
NZ-06	Central to Upper Aquifer EWs
NZ-75	Within the northern cluster of EWs
NZ-54/NZ-94	SE of the percolation ponds; SE extent of OU-1 TCE plume
NZ-42/NZ-43	Well pair near EW-1
NZ-07	Up-gradient of EW-9
NZ-27/NZ-102	Eastern edge of the Upper Aquifer, northwest of proposed Runway Faults
NZ-98	Northern part of OU-1, Lower Aquifer well